# Frankly Speaking

## "United We Stand . . ."

WITH world conditions as they are, I think that we have all had plenty of opportunity to note the strength that may be gained through cooperation as contrasted with the weakness, indecision, and general inability to do really big things that directly result from a lack of cooperation and from working at cross purposes.

I wonder if we sufficiently realize that what is true of nations is also true of organized groups of individuals like our Institute of Traffic Engineers?

For the past two years, Leslie J. Sorenson and I have had the pleasure of working in close cooperation on a specific project with a considerable group of Institute members. That project, which has now been completed, is the TRAFFIC ENGINEERING HANDBOOK.

The point is that the Handbook was essentially a cooperative project. Before a word was written, the content material was outlined by the members of the Institute. The editors then assigned the various subjects to individuals who were thoroughly experienced in specific fields, and the contributing editors went to work at the actual writing. Other persons, not included in the list of the fourteen contributing editors, submitted some of the text material. As the book was written, it was reviewed, criticized, torn to pieces and put together again by a review committee which pulled no punches. Representatives of outside organizations also assisted in the development of the book.

Without the cooperation of all these people, the TRAFFIC ENGINEERING HANDBOOK would not be as good as it is. Without the cooperation of most of them, it would not have been written at all.

The Institute of Traffic Engineers has now been in existence for twelve years. During the past several years, there has been an increasing tendency by the Institute as a group and by groups of Institute members to undertake large-scale projects which require cooperation for their success. Much of this cooperation has been with outside organizations, both official and unofficial, and the results achieved have been most gratifying.

Such cooperative efforts should be continued and increased. The Institute of Traffic Engineers has grown up. It is a powerful organization of highly-trained men, capable of accomplishing large results through cooperation within its ranks and also with many other organizations.

The Board of Direction always welcomes and carefully considers cooperative project suggestions offered by members. Why not offer a suggestion that in your opinion will help strengthen the position of the ITE and increase its importance in the traffic field?

Harold S. Hammond

Vice-President I.T.E.

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# VALUE OF A TRAFFIC AND SAFETY DIVISION OF A STATE HIGHWAY DEPARTMENT

*by* D. GRANT MICKLE

"GET us out of the mud" was the early cry of the good roads movement. The principal concern of highway engineers fifteen or twenty years ago was to improve the roads so that farmers could get their produce to town and motorists in adjacent towns could visit back and forth with a minimum of jolts and with reasonable assurance that they could reach their destination.

The demand for "good roads" was so urgent that little time or thought was given to roadway alignment, curvature or sight distance. Furthermore, the fairly new automobile was incapable of the speeds now common today and the problems of congestion and accidents had not appeared on the scene to plague the officials charged with highway administration.

As the highways were improved and as their improvement invited more and more passenger and commercial travel, the need for directional signs and markers became evident. Communities began to compete for the tourist trade. Road associations were formed. Markers were erected by these associations and by local civic or automobile clubs. Their purpose was to encourage trade and little thought was given to standardization of signing or to the uniform marking of hazardous conditions.

The highway engineer was busily and steadily engaged in improving surfaces and subgrades. Often, these improvements were applied to the old rights-of-way with their horse and buggy grades and curves.

During all this time, the automotive engineer ,too, was improving his product. Passenger vehicles were becoming more comfortable and more quiet, attaining greater speed. Trucks began to carry greater and heavier loads.

The maintenance engineer meantime was developing better techniques for road maintenance. He found it necessary to replace the old privately installed directional signs and markers and they became a part of his maintenance job. The road bed was being developed and the rolling stock was being improved, but very little attention was being given to the correlation of the two—in other words, the operating function had not yet become a conscious part of highway administration.

Each state was developing a traffic marking system of its own. Tourists traveling between states or even parts of the larger states were confused by the multiplicity of signing methods. About 1929, a conference was called in Washington, D. C., to develop standard signs and markings and uniform warrants for their application. From these early meetings, the modern signing practices have developed.

At about this time, engineers were beginning to specialize in a new phase of their profession. In the same manner that other engineers were specializing in highway construction, maintenance, testing or soil mechanics, they devoted their thought and research along lines of traffic control and accident reduction. Basically engineers, they each focused their attention on this particular phase of highway transportation.

This somewhat long yet really brief historical development has been presented in an attempt to show the evolution of the "operations" function of highway transportation.

It is the aim of design and construction engineers to provide highways of the greatest possible freedom and safety of traffic movement. It has been said that, given complete knowledge of

driver behavior and psychology, roads can be built which will make correct driving not only easy, but instinctive. The fact still remains that few sections of trouble-proof roadways actually exist, and for the most part, highway traffic must be directed, warned or protected. This means traffic control.

With this need has come the development of traffic and safety divisions within Highway Departments. A typical reason for the establishment of such a division is stated in the 18th Biennial Report of the Michigan State Highway Commissioner.

"The Traffic and Safety Division was established as a result of two causes. The most important of these was a broadening of the field of highway administration's responsibility for efficient highway transportation service. The mere building and maintenance of roads once met the highway administrator's obligations, but need for additional effort to prevent accidents was soon recognized and a more general supervision and regulation of traffic came in natural sequence.

"The second factor emphasizing the need for the new division was the action of recent legislatures in placing added authority in the hands of the State Highway Commissioner with regard to speed limitations on urban trunkline streets and the standardization of signs, signals, and pavement markings on all public roads and streets."

Fundamentally, the Traffic and Safety Division has two direct responsibilities. One, the relief of congestion or the facilitation of traffic movement and two, the provision for the safest possible operating condition. These responsibilities are fulfilled by means of improvements which provide better utilization of existing facilities and by means of advice in the design of adequate new facilities.

The inherent operating features of the highway are dependent on the design, construction, and maintenance policies. It is apparent, therefore, that the Traffic and Safety Division should serve in an advisory capacity with the divisions in charge of this work, particularly those of design and maintenance. New highway plans should be checked by this Division as well as permits which might affect the safety of traffic. Men trained in and familiar with the movement, behavior, and reactions of the motoring public are qualified by training and experience to predict the extent to which curvature, width, radius, intersection treatment, sight distance, and other factors affect traffic, and their inspection of the plan or permit is therefore important.

Defense activities are in the minds of all of us. This is particularly true in those areas in which defense industrial activities are concentrated.

Priorities are making it more and more difficult to obtain materials for highway and bridge construction and for traffic control equipment. We are told that by July 1, 1942, most defense industries will reach their peak employment, or, at least, they will be operating on a far greater scale than they are at the present moment. This means increased traffic loads on many roadways, a shifting of the traffic pattern and an acceleration in the movement of commodities and people from place to place. Many defense plants actually use the highways and streets as part of their assembly line. Streets and highways in these defense areas must work at peak efficiency. With our inability to obtain sufficient materials, it will be impossible in many instances to build new highway facilities or to greatly improve those already existing.

Herein lies a challenge to the traffic engineer—a challenge to his ingenuity and to his ability to exact the utmost utility and safety from existing facilities.

Highway administrators throughout the nation and particularly in those areas where defense production is concentrated will be under an ever increasing pressure to move more men and more materials to and from our mushrooming arsenals of Democracy. On top of this load, must be added the extra vehicular and pedestrian traffic which an expanding business activity inevitably brings.

Even if a plentiful supply of materials were available, the urgency of the emergency condition which has been imposed upon our entire street and highway system precludes any large scale construction which, of course, would be the desirable solution to the problem.

But don't misunderstand! In foregoing some major projects for the time being, we need not adopt a defeatist attitude and jump to the unwarranted conclusion that whatever we do now to increase utility of present facilities, is only a stop-gap or temporary remedy. By improving the overall efficiency of the existing system, we will be laying a sound foundation for future development and at the same time, meeting immediate demand for safe and facile traffic movement.

By virtue of training and experience, the traffic engineer is particularly well qualified for the job which lies ahead. Rising from the category of technical investigator and advisor for enforcement authorities, the traffic engineer has broadened his field to include a working knowledge of all the elements in a well balanced traffic improvement program. The knowledge of what can be expected from educational and enforcement efforts serves as a guide for the nature and extent of physical improvements which he recommends. This, coupled with practical engineering knowledge and a background of research in traffic movement equips the traffic engineer with the insight to give invaluable advice to the highway administrator.

Highway transportation is and will continue to be the great integrating and correlating element in the economic and social life of our nation. Planning for the future expansion and betterment of our highway system and exacting the greatest possible use from the present system is the problem faced by every highway authority. Good traffic engineering counsel will help the highway administrator to face the problem clearly and give him the necessary facts to tackle the job effectively.

Digest of a paper presented by D. Grant Mickle (Mem. I.T.E.), Traffic Engineer, City of Detroit, at the 27th Annual Convention of the American Association of State Highway Officials at Detroit, Michigan, 1941.

## INTERSECTIONS

*by* H. J. Blackmon

WHEN two streams of traffic cross, a potential operating hazard exists. With higher traffic density, this hazard becomes more acute. Accidents at intersections on State highways in South Carolina increased from 561 in 1939 to 794 in 1940. This is a forty-two per cent increase in intersection accidents during a period of one year. Fatal accidents at intersections on State highways increased from 42 in 1939 to 51 in 1940.

Most highways intersect at grade. The general types of intersections at grade used in this State are as follows:

Two highways crossing, that is, each highway continuous in a straight line or nearly so beyond the intersection.

The T-type in which one of the

highways intersects a continuous highway at or nearly right angles.

Y-intersections in which two highways separate at nearly equal angles.

"Branch" intersections—this is where the second road intersects the continuous highway at a small angle.

Many factors enter into the selection of the type of intersection to be used. These are traffic density, character of traffic, vehicular speeds, and local conditions such as cost of right of way and physical characteristics. Probably the most important factor in the design of intersections is traffic density. This determines whether or not one road should be given preference over the other highway. If one road should have preference over the other intersecting highway, this can be accomplished sometimes more effectively by the physical features of the intersection such as the T-intersection. Of course, regulatory signs will be necessary as a supplement for the control of traffic. Enforcement of the signs at T-intersections is made considerably easier by such a design. Other factors in the selection of the type of intersection mainly govern the extent of the design.

When the directions of two highways make it necessary that they cross, it is more desirable that they intersect at or nearly right angles. This gives the drivers on all the four approaches to the intersection an equal opportunity to see a vehicle on the highway to be crossed. Sometimes it is necessary to change the alignment of one of the intersecting roads approaching the intersection to obtain the desired design. This should be done where it is practical and where it will not introduce a physical hazard into the layout of the highway. In a few locations we have used the staggered type crossing where the roads intersect at an oblique angle. This results in two acute angle intersections. It is highly important that the type of intersection, where two highways cross at right angles, be provided with proper type of traffic control. This may be warning signs, stop signs, or traffic signals.

The T-intersection is used where the continuous highway is the preference road. This may be an all paved T-intersection or providing for separate turning lanes for the third leg of the intersection. The question of separate turning lanes for traffic depends upon the density of traffic on the third road of the intersection with reference to the density on the continuous highway and on the right of way available. Traffic through this type of intersection is usually controlled by a stop sign on the minor road.

The Y-type intersection has been used quite extensively in this State where both roads branch off on curves from a common tangent approaching the intersection. It is used where two highways of equal or nearly equal importance intersect. This type intersection has been found to operate with a normal accident rate under low or average traffic density. However, under heavy traffic conditions the Y-type intersection appears to become considerably more hazardous.

Warning signs and channelization are the only forms of traffic control adaptable to the Y-intersection. Channelization appears to offer very effective means of traffic control under low speed conditions but not under high speeds such as may be found in the rural areas.

The "Branch" type intersection is where a road on tangent is intersected by a second road at a small angle. This type intersection may result in a curve to the right or left approaching the intersection. The type intersections where the continuous road is intersected with a curve from the right appears to provide a less hazardous intersection. The main conflicting traffic

movement in this intersection on a curve to the right is composed of a left turning movement from the tangent road to angle road crossing the path of a straight through movement on the tangent road. The right of way is definitely established in these conflicting movements, the straight through traffic having the right of way over the left turning traffic.

In the intersection where the approach is on a curve to the left, the major conflicting movement is two straight through movements, that is, traffic moving through the intersection on the continuous road and a vehicle entering the intersection in the opposite direction from the road at an angle.

The vehicle having the right of way in this case is not so clearly defined as in the preceding case, therefore, resulting in a more hazardous type intersection. We have used both types of intersection quite extensively in this State. However, in the past few years we are using the left type intersection less because of the hazardous conflicting movement previously discussed.

The "Branch" type intersection is usually controlled either by warning signs or stop signs. This type intersection is not so adaptable to stop sign control because the physical layout encourages high speed travel within the intersection area.

The traffic circle offers an effective means of controlling conflicting streams of traffic at intersections of high traffic density.

About two years ago, we decided to design a traffic circle for a rural intersection with light traffic volumes and high speed traffic as an experiment. The inside diameter of this circle is 380 feet. The approaches to the circle are curves with radii of 350 feet on two entrances and with radii of 575 feet and 1,150 feet on the other approaches. The entrances to the circle are illuminated with sodium vapor lights during the hours of darkness.

This traffic circle has been in operation for approximately one year and no accidents have been reported during this period. The period of operation has not been sufficiently long to warrant any definite conclusion.

During the construction of Fort Jackson, a large military reservation near Columbia, considerable congestion was experienced at the intersection of the main highway from Columbia to the Fort and an important road in the reservation. The average twenty-four hour traffic through this intersection was approximately 12,000 vehicles. Due to the heavy vehicular volumes, it was necessary to patrol this intersection a large portion of the day.

After considerable study, we decided to construct a traffic circle in cooperation with the army as a means of relieving the congestion at this intersection. A traffic circle of elliptical shape was designed because it was better adapted to the traffic movements through the intersection than a true circle. Two radii of this ellipse are 180 feet and the other two 110 feet. The approaches to the traffic circle are curves of 180 foot radii.

This traffic circle has been in operation approximately five months and has given very efficient control. Congestion has been relieved at the intersection and safe operation provided.

The ultimate solution to the conflict of movements at many intersections is the grade separation. The design of grade separations involves separating conflicting streams of traffic by placing one over the other and varying only in providing for turning movements at the intersection. Local conditions govern the extent of design for interchanging traffic between the two highways. In the case where two highways cross at or nearly right an-

gles the cloverleaf connection is the ideal to be achieved in design.

The use of grade separations in this state or section has been retarded because of the large investments involved and because the public has not yet demanded their widespread use. The public is aware of the hazards of highway-railroad grade crossings and has demanded effective means of eliminating these hazards. Probably some program similar to the railway grade crossing elimination program will have to be initiated before highway grade separations are used extensively.

While signs and pavement markings are not necessarily functions in the design of the roadbed, it might be well to stress their importance at road intersections, and at physical hazards along the road. The placing of signs and the pavement marking are handled by the maintenance forces immediately after the road is opened to traffic.

*RIGHT-OF-WAY.* The minimum width right-of-way is seventy-five feet for two lane roads and two hundred feet for four-lane divided roads. These widths vary slightly through congested areas. Extra width is obtained where necessary for heavy cuts and fills.

In order to protect bridges from falling trees, a right-of-way of one hundred and fifty feet is obtained for the entire length of the bridge plus seventy-five feet on each end of the bridge.

It is also necessary to secure right-of-way for outfall ditches and triangular shaped areas at road intersections to insure proper sight distances.

Condensed from an original paper presented by H. J. Blackmon, Chief of Surveys and Plans, S. C. State Highway Department at the First Southeastern Engineering Conference, Clemson, N. C., September, 1941.

## TRAFFIC SIGNAL CONTROL MOVES AHEAD

*by* T. T. WILEY

TRAFFIC congestion at important intersections is a common problem of traffic engineers. In order to reduce congestion to a minimum, it is essential to utilize the intersection to the greatest possible efficiency. Traffic signals are the most common device used to approach such efficiency. There are two general types of traffic signal controllers available, fixed-time and traffic-actuated. There are several sub-classifications under each type, each of which has its particular uses.

Upon the assumption that the readers are familiar to some extent with these types of traffic signal controllers, the purpose of this article is not to present a treatise on traffic signals, but to acquaint traffic engineers with the latest development in traffic-actuated controllers.

The standard type of full-actuated controller has been subjected to two primary criticisms under conditions of heavy traffic. One objection is that with vehicle intervals set at normal values, the controller tends to approach fixed-time operation under heavy traffic. The other is that coordination with adjacent signals is not assured or, if coordination is provided, then much of the value of actuation may be lost due to the necessity to operate on a total fixed-time cycle.

Just how much weight should be attached to these objections is debatable, but whether valid or not, it has long appeared to me that the possibilities of traffic actuation were far from completely explored and that it was highly desirable, and should be possible, to design a controller that would over-

come these limitations of existing types of actuated control.

About two years ago, after the Detroit Traffic Engineering Bureau was founded, discussions were started with representatives of traffic-actuated controller manufacturers. The designers were concerned with the same problems and had attacked it from the same standpoint that we had in mind, namely, a controller in which the vehicle interval varied with traffic conditions instead of remaining at the given value fixed on a dial. In fact, they had already built a controller utilizing this idea.

As a result of these conversations and a trial of the new controller, it was redesigned to include the basic features of the type of controller first used at three important adjacent intersections in Detroit.

Briefly, the controller has these timing characteristics which are established by setting the proper dial for each phase:

1. A fixed minimum initial period to clear a fixed number of waiting cars.
2. A variable added initial period to clear any number of waiting cars in excess of the number handled by the minimum initial period.
3. A variable time extension period whose duration depends upon the *number* of impulses from each street. The impulses affect the timing of one fixed vehicle interval and *three continuously variable vehicle intervals* as follows:
   a. A fixed vehicle interval whose length is set at the number of seconds required to move from the detector to the stop line.
   b. A vehicle interval starting at an initial value of 15 seconds at the start of the Phase A green and, as soon as a car is recorded on Phase B, decreasing at an adjustable rate to an adjustable minimum.
   c. A vehicle interval starting at an initial value of 15 seconds at the start of the Phase A green and being reduced at an adjustable rate to an adjustable minimum by each car waiting on the Phase B red.
   d. A vehicle interval starting at an initial value of 15 seconds at the start of the Phase A green and being reduced at an adjustable rate to an adjustable minimum by each impulse on Phase A during the first 10 seconds of Phase A green.
   e At any instant when the time elapsed since the receipt of the last impulse on Phase A exceeds the value of any of the vehicle intervals at that instant, the right of way will be transferred to Phase B.
4. The normal adjustable yellow clearance period.
5. An adjustable timing circuit to control the maximum length of any of the above periods.
6. A circuit which "remembers" or "carries over" an adjustable percentage of the cars recorded on Phase A during one cycle and considers this percentage to be waiting for the start of the next Phase A green.
7. All of these timing circuits for Phase A are also provided for Phase B.

Study of these characteristics will show that three traffic conditions are considered by the controller in assigning the right-of-way: (1) density of traffic moving on the green, (2) density of traffic waiting on the red, and (3) time elapsed since a car has been waiting on the red.

The wide range of adjustment of the several timing circuits makes it possible to adjust the controller so as

to obtain a very high efficiency in right-of-way assignment under all traffic conditions—light, medium, and heavy. Furthermore, the "carryover" circuit makes it possible to develop progressive movement by placing the controller in position to give the green to an approaching platoon as soon as the first few cars approaching are detected. The characteristics of this controller have led us to call it a *self-coordinating, traffic-density-actuated controller*. This word description makes the controller sound exceedingly complex. Actually, such is not the case as all the circuits are simple and the 28 dials provided are neatly arranged, labelled, and useful.

Three of these controllers are now in use in Detroit at the three points of a triangle formed by Gratiot Avenue, Grand Boulevard, and Warren Avenue, all three of which are major traffic arteries. The storage areas on two sides of this triangle are only about 150 ft. long and on the third side about 350 ft. long. With traffic entering this triangle at a rate exceeding 6,000 cars per hour during the rush hour, it is difficult to conceive a more complex problem in traffic signal timing.

Before the installation of the self-coordinating, traffic-density-actuated controllers, a temporary fixed-time system was used which was operated on a 60 second cycle. Perfect progression was provided in three directions around the triangle, very poor progression in a fourth and only fair progression in the other two. It is possible that the most advanced types of fixed-time equipment would have afforded somewhat more efficient movement than this fixed-time arrangement, although the nature of the triangular layout and the heavy conflicting traffic movements greatly restrict the timing possibilities.

With the traffic density-actuated controllers, no inter-connection or mechanical supervision is used. From the electrical standpoint, each intersection operates entirely independently of the others.

Traffic studies to determine the number of stops and the delay during the rush hours from 3 to 6 P.M. were made on comparable days immediately before and after the new controllers were installed. The results have been tabulated and a summarization may be obtained from the author. An analysis of these results shows that the self-coordinating, traffic-density-actuated controllers are providing better progression than the fixed-time controllers, with an actual reduction in stops of 16%. A reduction in total delay of 45% is indicated.

The figures demonstrate that this type of control has definite merit. Actual observation of the behavior of traffic throughout the day is just as convincing. The lengths of green and red periods under all traffic conditions vary continuously to meet these conditions, and a surprisingly high degree of coordination is evident at each of the three intersections.

Several additional installations of this type of control are to be made in Detroit at locations more typical in nature. Studies of comparative behavior of different types of control at these locations will be made and data obtained to enable a more accurate and complete evaluation of the advantages of traffic density actuation. However, experience to date leads to the conclusion that the self-coordinating, traffic-density-actuated signal controller is a very important development in traffic control.

An original article by T. T. Wiley (Assoc. I.T.E.), Assistant Traffic Engineer, Detroit, Mich.

# OFF-STREET PARKING CONTROL

*by* ROBERT A. MITCHELL

MUNICIPAL authorities in several cities have felt the need for more adequate control over the operation of parking lots and garages. In March 1941, an ordinance was approved in Philadelphia which gave considerable power to the Department of Public Safety in such matters. Washington, D. C. has a similar law and one is now being considered by Pittsburgh.

Philadelphia's ordinance was the outcome of continuous public complaints about the irresponsible practices of parking lot operators. Among these were: (1) refusing to pay for damages to parked vehicles, (2) blocking sidewalks with parked cars, (3) backing cars into the street and delaying traffic, (4) moving vehicles from one location to another without the owner's consent, and (5) posting confusing rate signs with the rates liable to a boost at the slightest provocation. It was these practices rather than accident hazards to pedestrians or vehicles that caused public resentment. As a matter of fact, our accident records indicate that such hazards are not serious.

The Philadelphia Parking Lot Ordinance covers licensing and registration, the erection of barriers, the size and location of driveways, the quality and type of lighting, and the type and location of rate signs. It further requires signed consent cards before a vehicle can be moved from one location to another, the keeping of a visible record of the license numbers of all cars parked, and the furnishing of a bond in case of failure to pay damage suits. In addition, it makes it illegal for the lot or garage operators to park cars on the sidewalk or drive them into the street to rearrange the parking space. Previously, only the car owner could be summoned for these illegal practices.

*Details of Ordinance*

License fees range from five to twenty dollars for public lots or garages according to their capacity and a straight two dollar fee for private establishments.

Barriers must be erected on all lots over twenty-five hundred square feet in area along the building lines abutting on public streets with no opening over thirty feet wide. Barriers may be brick or concrete walls twenty-four inches high or metal posts thirty inches high, spaced not over five feet on center and connected by a metal rail, cable or wire mesh. Private lots are allowed to install a Cyclone or Page wire fence and no connection is required on the metal barriers around used car lots.

No driveways can be over thirty feet wide and their location and number must be approved by the Traffic Engineer and the Bureau of Highways. Where the present driveways are over thirty feet wide the excess width is closed by the barrier.

All parking or used car lots operated during hours of darkness must install flood lighting approved by the Electrical Bureau which must also approve the electrical work in all garages.

Every parking lot and garage must display at the entrances, signs bearing the name of the operator or owner and parking rates in which the size of the numerals and letters denoting time and price must be of the same height. Four inches is the smallest and twelve inches the largest size allowed. In addition, prices posted at 8:00 A.M. must be adhered to for the following twenty-four hours.

In order to better insure the payment of damages for accidents, operators or owners of all establishments who fail to satisfy court judgment within thirty days are closed down and can not reopen until they pay the damages and furnish a two thousand dollar bond to the Director of Public Safety.

The ordinance also provides that the Department of Public Safety shall determine the number of vehicles that can be parked on the lot or in the garage and that when this number is reached, the operator must place a sign FILLED at the entrances to the establishment and allow no more vehicles to enter.

*Operation of Ordinance*

The Traffic Engineering Division was made responsible for the administration and enforcement of this ordinance and a sergeant of police and ten police officers were assigned to help carry out the work.

The names and addresses of operators of all parking lots, used car lots, and garages were obtained by the police department for the traffic engineer. Printed instructions were then delivered to each operator. They were required to prepare a scaled dimensioned plan of their establishment showing its location, driveways, proposed barriers, proposed signs and electrical outlets and fixtures. Garage operators had to show all ramps or elevators and a plan of each floor. Three blueprints of each plan were required for the traffic engineer and two small photostats for the Zoning Commission.

Each operator is required to make out a license application and starting in the traffic engineer's office where his plan is checked and approved, he must obtain approval from the Zoning Commission, Bureau of Highways, Building Inspector, Fire Marshal and the Electrical Bureau. When these approvals are returned to the traffic engineer's office together with a receipt of his tax payment, he receives an official license which he must keep prominently displayed at his establishment.

At first it was quite a problem with over three thousand lots and garages involved, to enforce the provisions of the ordinance, in spite of the fact that there was a penalty up to $50 per day for not complying. The ordinance was then amended to give the Director of Public Safety authority to quarantine any establishment which failed to abide by the regulations. We started out to close five parking lots each day. At the end of three days the "trade" saw we were serious and we had no further trouble in getting their cooperation.

Daily surveillance is necessary, however, to enforce the provisions of parking cars on the sidewalk, backing cars into the street and moving cars to other locations without owner's consent card. At least thirty summonses are issued every day for violation of these provisions and the fine is $7.67 each.

An original article by Robert A. Mitchel (Mem. I.T.E.), Traffic Engineer, Division of Traffic Engineering, Department of Public Safety, Philadelphia, Pa.

## 1941 ACCOMPLISHMENTS?

List and return by the new year any and all known Traffic Engineering accomplishments during 1941—New Departments, Techniques, Surveys, Ordinances, Street and Highway Designs, Signal Systems, Signs, Offstreet Terminals, Research Findings, Safety Awards, etc.

# TRAFFIC ENGINEERING IN THE MOTOR TRUCKING INDUSTRY

*by* DONALD S. MACDONALD

THERE are two ways in which truck operators may co-operate with highway agencies of government. First, activities on the part of the operators themselves wherever possible, to regulate the safety and efficiency of their vehicle movement will help by taking a load off government administrators' shoulders. Second, intelligent assistance and advice to highway officials, and co-operation in carrying out their plans, will promote safety and efficiency, not only of truck movement, but of traffic flow as a whole.

In return for such assistance, there are three ways (and probably more) in which traffic engineers of government agencies may co-operate with truck operators. First, suggestions of the operators in regard to minor highway improvements may be given sympathetic attention, and when practical and reasonable, acted upon. Second, the operators' judgment may be consulted in establishing truck routes and restrictions on use of roads by trucks. Third, regulations pertaining to operation of motor vehicles may be submitted to fleet operators, who may be able to contribute suggestions for improvement, as well as mere criticism or condemnation.

Much of this co-operation already exists. But it can be carried on more satisfactorily, granted an aggressive approach to the problem and the establishment of more definite channels of contact. In this connection, a man with traffic engineering training may serve a trucking company by determining ways in which government and his company may work together for mutual advantage.

A large fleet requires what amounts to a miniature motor vehicle department which handles vehicle registrations, accident records and driver records. A traffic engineer is of service in setting up such a department; establishing the procedures used in collecting and filing data; analyzing the data collected; utilizing the data to obtain increased fleet efficiency and safety through formulation of regulations, re-routing, driver education and accident follow-ups with drivers.

Through analysis of accident records it may appear that certain causes are predominantly responsible. From the records, it might also develop that certain locations or sections of highway have a comparatively high accident frequency. In such cases, frequency could be reduced by warning drivers to use extreme caution, making an engineering analysis of the location and recommending improvements to the highway department, re-routing trucks to avoid the location entirely.

Driver violations are often an index of future accidents. In any event they are liable to involve adverse publicity, expense, and loss of working time. Therefore, violations should be handled in much the same way as accidents.

By co-operation with the Operations Department, the traffic engineer may obtain records of running times of the fleet on various routes, and analyze them to determine causes for slow speeds. If these causes turn out to be physical problems, resulting from such factors as traffic, highway alignment, or vehicle characteristics, recommendations for improvement may be made; if the causes are personnel problems, they can be brought to the attention of the Personnel Director.

Driver record files should be set up to summarize—by individual drivers—accidents, violations, and mileage driven. These are among the most val-

uable tools of a safety program, because they can be averaged month by month to measure individual and group progress, and to demonstrate the progress (or lack of it) to employees; they can be averaged annually as a basis for awards, and also for comparison with other fleets, as a measure of relative efficiency; they can be used to pick out below-average drivers; they can be used to determine which groups of drivers—by age, race, etc.—are best suited for their jobs, as a basis for future employment policy.

Statistics as such are dry and uninteresting, but when attractively made into pictorial charts and graphs they get a lot of attention. Statistics can be utilized by individual fleets for their drivers.

Laws and regulations can be made readable by re-writing and illustrating them.

Knowledge of the fine points of truck driving, even among experienced men, is surprisingly scarce. There is a big opportunity here both for reducing accidents and delays and for increasing average vehicle life by a definite driver training program.

Four media available to fleets for educational purposes are: printed bulletins and pamphlets; talks; still or motion pictures; and individual instruction. Attractive driver instruction manuals, together with periodic bulletins, make effective and inexpensive means of education. Talks and pictures are even more certain of attention if well planned and executed.

Truck fleets could exert considerable influence toward improving laws and regulations affecting truck operations, if State and other government agencies were convinced that the operators knew what they were talking about, and had a good case to back up their recommendations.

Proper co-operation here requires constant keeping up with pending legislation and with changing conditions of operation.

The management of a fleet should have thorough familiarity with the laws of the various jurisdictions under which it operates. In addition, these laws should be supplemented by company regulations designed to meet individual problems.

All States, and the Interstate Commerce Commission, publish compilations of their motor vehicle laws; but these publications are bulky and complicated, and each differs from the rest to some degree. They could be combined into one easily-read manual, which should also include individual company rules.

Since trucks must share right-of-way with other vehicles, the operation of such other vehicles has considerable bearing on the efficiency of truck movement. Traffic engineering methods could be applied in making studies and analyses of traffic conditions on main truck routes. Out of such studies recommendations would come for doing away with bottlenecks through action by either truck operators or government agencies.

An application of traffic planning of considerable potential value, is the design of terminals and yards for safe and efficient vehicle movement. Curvature of entrance drives, sight distance at intersection of drive with public street, location of parking facilities, and so forth, are examples of items to which traffic planning may be profitably applied.

The contribution a traffic engineer can make in a motor trucking organization is both direct and indirect.

The indirect contribution is to make possible more effective co-operation between the fleet and government agencies.

The direct contribution is to improve efficiency and safety of fleet operation. This can be done through

studies of routes, and formulation of recommendations for improvement of traffic conditions — through action either of the company or of the highway agency; accident and violation analysis, driver records, and driver education; analysis of laws and regulations, codifying and simplifying them and making recommendations for modification where advisable; and design of terminal facilities for efficient truck movement.

A digest of a study by Donald S. Macdonald, Traffic Engineer of the Research Division of the McCarthy Freight System, Inc., Oct. 1941.

## PUBLIC RELATIONS JOB NO. 1

*by* BERNARD C. HARTUNG

THE year 1941 finds the average Highway Department or Bureau of Public Works, whether it be a state, county, or community organization, occupying a much different position than it did ten to twenty years ago. One might consider this a natural development due to the rapid expansion in road building over the past two decades but at the same time it is enlightening to "look over" this situation and see just what has happened along certain specific lines. It is undeniable that, with the increase or expansion of activities, there has grown up a much closer relationship between the "customer" or travelling public and the men who are responsible for the construction, maintenance, and operation of our roadway system.

Without attempting to touch the growth and advancements that have taken place in construction and maintenance, let us take a look at one specific development in the field of operation, i.e., traffic engineering. Just as the motorist has learned to appreciate smooth dustless roads, modern alignment and grades so has he come to regard safety features and uniform sign treatment as necessary appendages to our highway systems. Improved signs, signals, and markings mean much more to him today than they did ten or twenty years ago. He notices these devices each time that he drives over the roadways and gradually has built up a thorough respect for the well-treated section of highway as well as a keen dislike for those stretches that lack proper signing or marking.

The traffic engineer is a man who is usually responsible for most of these visible features, i.e., signs and markers, intersectional islands, etc. It is up to him to keep such units in good condition and sufficiently advanced in design, etc. to catch the imagination and favor of our friends, the highway customers. This undertaking is an expensive one. Signs cost money as do reflector units and traffic lacquer or paint. It is much the same proposition that faces the average business concern, i.e., the necessity of keeping up a good appearance of buildings or grounds under conditions which embody rapid depreciation and change. In view of the rather large proportional costs of "dressing up the roadway," the traffic engineer or official in charge of this work must be consistently on the lookout for economies. The biggest help which comes to him in this respect is the process of standardization. Through this, he is able to cut down on the number and types of devices used and to concentrate on those units which will be employed predominantly in his particular territory. Without uniformity, he is consistently on the spot due to the neces-

sity of revising his program in order to keep up with the neighboring state or community.

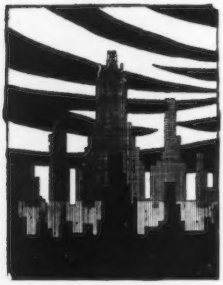
As emphasized at the beginning of this article the travelling public is becoming more critical and observing each year. This is understandable inasmuch as these people, being familiar with improvements made elsewhere, are apt to demand similar conditions in their own localities. They have grown, and perhaps rightfully so, to regard the streets and highways as their property and consequently they want the best under existent conditions.

Unfortunately, this ever-expanding problem of *traffic control* and *operation* thrust itself on the states and municipalities in a comparatively short period of time. In other words, during the past ten or fifteen years this development and growth was nothing short of phenomenal. The motor vehicle during that time had been improved more rapidly than the roadway itself. This is due to the fact that the automobile is a relatively small piece of mechanism representing little per unit cost. The highways on the other hand required large investments for improvements and modernization of comparatively small sections. As the years go by it is reasonable to assume that our road facilities will gradually approach the perfection that has been attained in the motor vehicle. Until that time, however, everyone of us will have the continuous job of adjusting these various factors which play such a prominent part in the field of motor transportation.

As mentioned previously, some of the most visible improvements or changes are those which are made through the use of signs, signals, markings, lane separation, intersectional redesign, etc. In truth, many of these are applied as emergency measures until reconstruction or redesign is possible. If these improvements, whether permanent or otherwise, work out, the engineer in charge is duly praised and commended. By the same token he must face criticism or rebuff if his recommendations or methods are unsuccessful. To consistently please such a vast group as is represented by the American motorists, with the funds available, is no small task. In fact, it involves a public relations job of considerable magnitude.

There are many individuals who feel that the traffic engineers assumed, to some degree, this public relations assignment when they stepped into the field several years ago. This is undoubtedly true due to the very nature of their work. However, it is a foregone conclusion that this task with its many complexities, required then and will continue to require the attention of specialists trained in traffic control methods. This is substantially borne out by the fact that each year more states and municipalities are adding to and improving their traffic engineering departments. They are beginning to realize that a division so closely in touch with the public must have adequate personnel. In view of the fact that these men have taken over duties which demand continued contact with the public it is essential that they not only be well trained but must have sufficient experience to meet situations of a complicated or controversial nature. It often happens that this traffic section must answer more frequently to Mr. and Mrs. John Q. Public than any of the other offices commonly associated with highway organizations.

An original article by Bernard C. Hartung (Jun. I.T.E.), Assistant Maintenance Engineer, in charge of Traffic, State Highway Department, Nevada.



# Stop, Look and Listen

## MEETING— EXECUTIVE COMMITTEE

The first scheduled meeting of the officers of the Institute, constituting the Executive Committee, was held at the Statler Hotel, Buffalo, New York, on Saturday, November 9. It was attended by the three officers, namely D. Grant Mickle, President; Harold F. Hammond, Vice-President; and W. Graham Cole, Secretary-Treasurer; who were in session from early in the morning until well into the evening. President Mickle called the meeting for the sole purpose of discussing committee appointments and other Institute matters, including specifically the program being developed in connection with the Plan for Immediate Improvement of Defense Production Transport, which was approved at the annual Meeting in Chicago.

The Executive Committee meeting provided an excellent opportunity for the officers to develop definite plans regarding activities for the current Institute year. It also set a precedent for future meetings of a similar nature.

At lunch the officers were joined by Mr. William Powell, Buffalo, who has accepted the appointment as Editor of the 1941 Proceedings; and Mr. Harry W. Osborne, newly appointed traffic engineer of Buffalo.

## MEMBERSHIP COMMITTEE REPORT

Nineteen applications for admission and five for transfer of grade in the Institute of Traffic Engineers were approved by the Membership Committee at its annual meeting in October. The following action was taken:

*Elected MEMBER*

Rusby, Clarence
Newark, New Jersey

*Elected ASSOCIATE MEMBER*

Condrey, M. C.
Cincinnati, Ohio

Galletley, W. O.
Columbia, South Carolina

Gravelle, Gordon K.
East Lansing, Michigan

Greer, Maurice V.
Austin, Texas

Malo, A. F.
Lansing, Michigan

McLendon, Willam C.
Green Bay, Wisconsin

Volk, Wayne N.
Madison, Wisconsin

*Elected JUNIOR MEMBER*

Havenner, Joseph E.
Salem, Oregon

Jackson, John R.
Little Rock, Arkansas

Kamy, Captain Harry
Fort Belvoir, Virginia

Lutz, Simon M., Jr.
New Cumberland, Pennsylvania

McCandliss, A. N.
Franklin, Pennsylvania

Moyer, Robert S.
Dayton, Ohio

Muffley, Paul D., Jr.
Williamsport, Pennsylvania

Myers, Fred J.
Salem, Oregon

Prisk, Charles W.
Arlington, Virginia

Schwendiman, Glenn
Chicago, Illinois

Upham, Charles M., Jr.
Washington, D. C.

Van Hagan, Charles E.
Madison, Wisconsin

*Transfer from JUNIOR to ASSOCIATE MEMBER*

Barton, Eugene
Plainfield, New Jersey

Mitchell, Adolphus
Raleigh, North Carolina

*Transfer from ASSOCIATE to MEMBER*

Fritts, Carl E.
Olympia, Washington

Smith, Wilbur S.
Columbia, South Carolina

Wiley, T. T.
Detroit, Michigan

## APPLICANTS FOR TRANSFER IN MEMBERSHIP—I.T.E.

Harry Porter, Jr.

District Traffic Engineer, Division of Highways, Illinois Department of Public Works & Buildings, 35 East Wacker Drive, Chicago, Ill. Now Associate Member.

## APPLICATIONS FOR MEMBERSHIP

Ralph F. Gross

Senior Traffic Engineer, Chicago Park District, Administration Building, Burnham Park, Chicago, Ill.

Richard G. Fencl

Senior Traffic Engineer, Chicago Park District, Administration Building, Burnham Park, Chicago, Ill.

## A.A.S.H.O. PRESIDENT

G. Donald Kennedy, state highway commissioner of Michigan, was elected president of the American Association of State Highway Officials at their annual meeting held at Detroit, Mich.

## SAFETY PLEDGE MADE BY NSC

The 30th National Safety Congress and Exposition held during October in Chicago, Ill., featured the theme of "Help Defense—Stop Accidents." The entire convention was planned around the slogan and all delegates pledged their continued efforts toward making this country safe and secure.

Secretary of the Navy Frank Knox, speaking at the annual banquet, declared "Safety in the carrying on of the nation's work is more imperatively needed than ever before—because we no longer have inexhaustible reserves of time at our disposal."

*Simple* BUT EFFICIENT GLO-LITE REFLECTORS

Unretouched snapshots show high day and night visibility of Glo-Lite Stop Sign

Simplicity is the keynote of the design of Glo-Lite Reflectors. This simplicity results in their high efficiency, both from the standpoint of day and night legibility, as well as from the installation and maintenance aspects. A trial order will convince you.

**GOTHARD MANUFACTURING CO.**
SPRINGFIELD ILLINOIS

## FIRST SOUTHEASTERN TRAFFIC ENGINEERING CONFERENCE HUGE SUCCESS

A program of outstanding speakers and a comprhensive coverage of the traffic engineering field was presented at the First Southeastern Traffic Engineering Conference held at Clemson College, Clemson, S. C., Sept. 9-12.

J. S. Williamson, chief highway commissioner of the South Carolina State Highway Department and president of the American Association of State Highway Officials, presided.

The list of speakers included: Harold F. Hammond, Wilbur S. Smith, Virden A. Rittgers, A. C. Taylor and Maxwell Halsey.

Others were Walter F. Rosenwald, D. Grant Mickle, Harry H. Harrison, W. K. Beckham, Joseph Barnett, H. J. Blackmon and Earl J. Reeder.

A panel discussion on traffic and national defense was held. Those participating were Lt. Colonel Lewis A. Page, A. W. Bohlen, Captain Fleming Mason, Virden Rittgers, Adolphus Mitchell and Maxwell Halsey.

Rear Admiral Percy W. Foote, Retired, of the U. S. Navy, and Captain William M. Angas, public works officer of the U. S. Navy Yard at Charleston discussed traffic problems due to defense industry expansion and driver training.

All meetings were held in the auditorium of the College Y.M.C.A., which is also used as a movie theatre. When any speaker overstepped his allotted time he was interrupted by a news reel or an animated cartoon.

The Conference was such a success that it is to be repeated next year.

## ELECTRIC SIGNALS

Standard signals adapted for all types of mounting. Synchronous and induction control mechanisms and accessory devices.

## REFLECTOR SIGNALS

When signs are not enough or expense is a factor, reflector signals keep down both cost and accident rate.

8"; Six 1⅝" Stimsonites

15"; Six 3" Stimsonites

## REFLECTOR SIGNS

Large Stimsonized and standard reflector button signs for all traffic conditions.

72" SIGN
18" LETTERS

24" SIGN
6" LETTERS

## DELINEATORS

Reflector Delineation gives essential road information after dark at daylight distances. The alignment and driving limits of the road are outlined by a channel of light.

SIGNAL SERVICE CORPORATION

SS SIGNALS

ELIZABETH, N. J.

## DO YOU KNOW

About a quarter of the 4,500,000 trucks on the highways are being used to carry defense goods.

There is a new type of license plate which will identify hit-and-run drivers. The plate has the usual markings but carries numbers on the back which will identify the car owner. In the event of an accident the plate, which is made of plastic, shatters and leaves the numbers scattered at the scene.

Atlanta, Ga. is experimenting with a traffic bridge to relieve congestion by allowing through traffic to pass over the intersection and turning traffic to remain on the street. It is built in three sections at a cost of $10,000.

Nevada has set up its own sign production plant to avoid delays due to nation wide conditions. Officials expect this venture to reduce the cost of signs and markers about 25 to 30%. They are also experimenting with a paint which contains a "float" to be used on center lines. This paint produces a roughened surface and is more effective for night driving.

A card, showing the central business district and the location of Lexington's (Va.) three free parking lots, is left on all cars which are parked on the city's streets.

England is experimenting with a new type of white line. Made of plastic, it is applied hot to the road surface and sets hard immediately.

The North Carolina Highway and Public Works Commission has passed an ordinance, effective Nov. 1, ordering all billboards and advertising signs to be moved back at least 50 feet from the center of North Carolina highways. Advertising signs on places of business adjoining the roads are not affected.

New speed signs which read 60 m.p.h. in daylight but only 50 m.p.h. in artificial light have been installed on one of Utah's principal routes.

## I.T.E. NEWS FROM TEXAS

A new Texas law governs cafes selling beer and permits these cafes to have only one sign, restricted to the word "beer," in front of their building. No beer signs are permitted within the cafe within five feet of a window and no other beer advertising signs are permitted within 200 feet of the premises on which the cafe is located. All other beer advertising must be posted on signs not less than 180 square feet.

The first speed zoning under the new Texas law has been established on U. S. Highway 81, between Austin and Waco, Texas. The project is approximately 100 miles long. Other short sections of speed zoning are in effect on U. S. Highway 80 and U. S. Highway 54 in El Paso County. The Texas Highway Department has also cooperated in establishing speed zones on certain county roads. Because the new speed law did not prefix the word "highway" with either the word "state" or the word "county," the Attorney General of Texas has ruled that the State Highway Department has the authority to zone not only the 26,000 miles of State Highway System, but also the vast county road system, which according to the latest census was in excess to 165,000 miles. Municipal speed zones which are under the jurisdiction of the city in which they are located have been established in Ft. Worth, Houston and Dallas.

Submitted by R. O. Swain

## LOOKING AHEAD

*December 1, Week of, Baltimore, Md., Johns Hopkins University*

Highway Research Board of the National Research Council. Director Roy W. Crum, 2101 Constitution Ave., Washington, D. C.

## TUTHILL HIGHWAY GUARD RAIL

Highly Efficient for Strength, Visibility and Low Cost

*Write for Descriptive Circular*

**TUTHILL SPRING CO. - CHICAGO, ILLINOIS**

*U. S. Spring & Bumper Co., Los Angeles, Cal.*
*Western Distributors and Mfrs.*


### TRUCK AND BUS INVENTORY

Latest tabulations released by the Public Roads Administration indicate that truck and bus owners generally are anxious to cooperate. However, the question "In case of an emergency would you voluntarily hire or lease your vehicle to a Federal agency?" seems to be misunderstood in some cases. Owners apparently feel that since they do not wish to do so it is not necessary to answer the questionnaire. It must be emphasized that all owners of trucks and busses should fill out and return the cards promptly in order to make the inventory a success.

### HIGHWAY SPIRAL TEMPLETS

Mr. T. R. Hartrampf of Hillsboro, Oregon, has developed a set of templets for mapping spiral curves which are being used with satisfaction by Oregon and Washington state highway departments.

The templets are classified by the rate of increase in degree of curve per station on the spiral. Almost any spiral curve can be drawn accurately without plotting numerous points and connecting them by an irregular curve..

Each templet is to the scale of 1 in. =100 ft. or one station of the spiral.

Eng. News-Record, Oct. 23

EAST OR WEST . . . IT'S

**CATAPHOTE Reflector Buttons**

*for Safer Night Driving*

Today . . . more and more miles of America's highways depend on Cataphote Reflector Buttons to control traffic at night! For example, the Pennsylvania Turnpike shown above directs motorists at night with a lane of beacons that are the shining eyes of Cataphote Niteway Outliners. Below is the San Francisco-Oakland Bridge effectively illuminated with Cataphote Center Lane Markers. The greater brilliance and durability of Cataphote Reflector Buttons makes them ideal for conventional STOP, SLOW, CURVE, TURN and DANGER signs. Write for details.

WESTERN CATAPHOTE CORPORATION
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## ROADSIDES

Mr. Flavel Shurtleff of the Editorial Board of "Planning and Civic Comment" suggests in the October issue that a re-examination be made of the limited access principle as a recipe for better roadsides. The question is raised "Can we make speedy progress with zoning?"

Mr. Shurtleff cites a short stretch adjoining the Merritt Parkway in Connecticut where the local zoning ordinance permits business. Placed on a lofty rock overlooking the Parkway is a large billboard. If this can happen within a short stretch of business zoning, Mr. Shurtleff wonders what would happen without zoning.

Limited access laws are in effect in New York, Rhode Island, California, Connecticut, Maine, West Virginia, Maryland, Michigan and Ohio. Under special law the Pennsylvania Turnpike is a limited access way with the right to plant out encroachments of billboards, yet thirty clusters of them are tacked on barns.

The Rim Parkway through the Pocono Mountains had to be protected by an act in 1941 prohibiting advertisements within 500 feet of the said highway.

The conclusion is drawn that each highway should be zoned as a unit by a state agency for speed in accomplishment, uniformity in regulation and economy in the purchase of right-of-way.

An amendment to the zoning law was introduced into the Connecticut legislature this year empowering the highway commission to propose to any town a zoning ordinance or an amendment to existing ordinances covering land adjacent to state and state-aid highways in lieu of the specified zoning authority.

Mr. Shurtleff says further that if better roadsides increase the efficiency and safety of highways especially those on the strategic network, we should have Federal zoning of them or an insistence by the Federal government that they be zoned by the States.

## HONEYMOON OR JAIL

The blowing of auto horns usually accompanying newlyweds may be eliminated in St. Louis if the wedding party takes a friendly tip from the police department. Otherwise, the celebration will be marred by arrests for disturbing the peace.

The tip is in the form of a letter from the police department to couples applying for marriage licenses at the St. Louis city hall.

The letter says:

"To the prospective bride and bridegroom:

"Attention:

"First of all, may we extend to you both our best wishes for many years of happiness on your contemplated entry into married life. Now, many newly married couples on their wedding day, . . . get into automobiles with their wedding parties and drive over the streets of St. Louis.

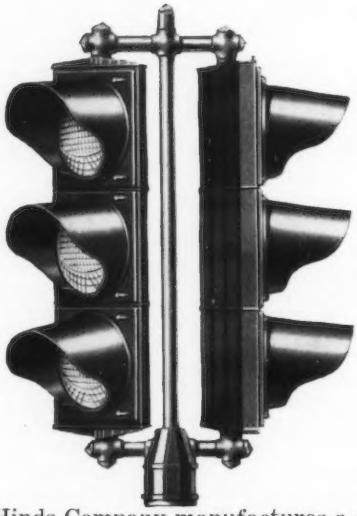
"Some of these wedding parties indulge in the thoughtless and nerve-wracking practice of loudly honking the horns of their cars . . . We would like to call your attention to the fact that this is definitely a violation of a city ordinance which prohibits the loud and unnecessary blowing of an automobile horn.

"Now, we do not want to mar your wedding day by having to give you a traffic summons for this violation, so we ask your cooperation along these lines. Again, wishing you the best of luck, success and much happiness for the future,

"We are,

"The St. Louis Police Department"

# CROUSE-HINDS
## *TRAFFIC SIGNALS*



The Crouse-Hinds Company manufactures a complete line of traffic signals and controls suitable for all traffic conditions. All signals have been carefully designed for the best possible efficiency and durability combined with an excellent appearance. Three-color and two-color signals are available for all types of mounting: span wire, mast arm, post, pedestal, and bracket arm. All signals are equipped with the Crouse-Hinds standard optical system, consisting of an accurate glass reflector and an especially designed lens which directs the beam of light towards the oncoming stream of traffic. All colored lenses are made of high transmission glass and the colors are carefully selected for traffic signal work.

**The lenses and light output of Crouse-Hinds signals meet the specifications of the Institute of Traffic Engineers.**

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TRAFFIC SIGNS
FOR STREETS
HIGHWAYS AND
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STREET NAME SIGNS

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PLATES

*Catalog Furnished on Request*

GOPHER STAMP & DIE CO.

CHICAGO & CUSTER

ST. PAUL - - - - MINNESOTA

## ON THE SHELF

SPEED REGULATION, National Safety Council, 20 N. Wacker Drive, Chicago, Ill., 63 pp., price 25c, single copies complimentary to officials. A comprehensive report on how to establish or revise speed laws, enforce regulations and educate motorists to changing speed conditions.

TRAFFIC STUDIES AND TRAFFIC REPORTS (Municipal), American Society of Planning Officials, 1313 East 60th St., Chicago, Ill., 4 pp., price 10c. A selected bibliography, 1941.

OFF STREET PARKING, American Society of Planning Officials, 1313 East 60th St., Chicago, Ill., 16 pp., price 15c. A selected list of references in zoning ordinances.

DECENTRALIZATION IN NEW YORK CITY, Robert H. Armstrong and Homer Hoyt. A preliminary report to Urban Land Institute, Jan. 1941, Urban Land Institute, Chicago, Ill., 195 pages.

OUTLINE AND BIBLIOGRAPHY for Course in HIGHWAY ECONOMICS, prepared by A. J. Bone under the direction of Committee on Highway Economics of the Educational Division of the American Road Builders' Association, C. B. Breed, Chairman, published by the American Road Builders' Association, International Building, Washington, D. C. Contains a course of instruction in highway economics and over 500 references in the broad field of highway economics, finance, taxation and administration.

## MEASURING DRIVER ATTITUDES

The value of traffic-safety education in improving the attitude of high-school students toward factors in safe driving has been demonstrated through the use of a new yardstick known as the Siebrecht Attitude Scale which is included in a research abstract published Nov. 1 under the title "Measuring Driver Attitudes" by the New York University Center for Safety Education.

The abstract has been prepared by Dr. Elmer B. Siebrecht, assistant teaching fellow at the Center, from a doctoral thesis which he recently submitted to the University's School of Education.

By applying the scale to some 2,000 high-school students in sixteen states throughout the country and the District of Columbia, Dr. Siebrecht showed that there was a steady improvement in the driving attitudes of youngsters from the first to the fourth year. He also found that student attitudes were further improved by a senior-year course in driver education and that even greater improvement followed actual road experience.

"Despite increased efforts to secure drivers who are physically sound, mentally alert, and skillfully fit, motor-vehicle accidents continue to lead all other types in the total accident picture," Dr. Siebrecht said.

"This situation has led administrators of motor-vehicle departments, license examiners, enforcement officials and laymen to the belief that faulty attitudes of drivers are responsible for many of the preventable accidents in traffic. This belief seems to be supported by the fact that a majority of motor-vehicle accidents occur to young drivers on open highways and in residential sections on dry, level straight-of-ways during clear weather under adverse speed conditions."

Forty statements which can be checked in ten minutes comprise the yardstick developed by Dr. Siebrecht. They are designed to measure attitudes toward such traffic-safety factors as "speeding," "drivers' examinations," "hit-and-run driving," "passing on hills and curves," and "courtesy to pedestrians." Although intended primarily for high-school testing, the scale has also been used experimentally in measuring attitudes of adults.

A progressive increase in the average score from group to group, "indicating the role that education apparently plays in the development of attitudes among high-school students," was found by Dr. Siebrecht when he administered the scale to different high-school groups in various parts of the country. The groups consisted of freshmen, sophomores, juniors, seniors, driver-training students, and students with driver-experience.

The average increased from 144 for freshmen and 151 for sophomores to 155 for juniors and 158 for seniors. For students in driver-training courses it jumped to 164. The highest average of all, 168, was achieved by students who had had actual experience in driving.

"The increase in the average score of the driver-training group over the senior group seems to indicate that special training in driver education and/or driver training does improve the attitudes of the subject, while the effect of practical experience in the driving of the automobile seems to be slightly more potent than theoretical experience in special courses," Dr. Siebrecht declared.

An individual's reaction to the various factors is measured by having him check the degree to which he agrees or disagrees with each of the forty statements, a typical one being "Hit-and-run drivers should be classified as criminals."

# *From Every Angle...*

## G-E Constant-speed Drive Is a Big Advantage of Type D Timers

IF your idea of a perfect traffic-signal timer is one that you can operate with the exact time lag required for progressive flow—relying on it for day-in and day-out service—then you're thinking of our Type D timer with synchronous-motor drive. This economical motor uses only six watts input, yet has plenty of power to drive the speed-reduction gears even when the temperature drops 'way below zero. Built-in, hermetically sealed gears have lifetime oil supply. Different cycle timing gears—the gears that determine the dial speed—can be easily installed in a few seconds with simple tools. What's more, provision is made for installing a flasher cam and contact assembly to give 60 flashes per minute on amber or red. Get the details today from the nearest G-E office. General Electric Company, Schenectady, New York.

**GENERAL ELECTRIC**

## TRAFFIC COUNTING SIMPLIFIED WITH NEW TRAFFIC COUNT DENOMINATOR

Illustration of 3 unit Counter, classifying directions of travel

Other models with from 1 to 12 classified counting units mounted in horizontal line.

By simply pressing key one count is recorded in classified counting unit controlled by that key. •

Touch method employed permitting operator to keep eyes on road at all times. •

Quick reset returns all counting units to zero. •

Counting units may be classified to represent direction of travel, different types of vehicles, state license plates, and other important classifications in traffic planning. •

Now in use by City, County and State Highway Departments throughout the U.S.A. •

Quick . . . Accurate . . . Efficient.

— WRITE FOR CATALOGUE —

**THE DENOMINATOR CO., Inc. - 261 Broadway, N. Y. City**


Some of the other statements are: "Strict enforcement of traffic regulations is the only way to prevent accidents"; "Pedestrians should at all times be solely responsible for their own safety"; "Every driver should be required to have his car inspected twice a year"; "A person should pass a physical examination before being issued a driver's license"; "The rudeness of traffic officers discourages courtesy on the part of the motorist"; and "Drivers convicted of driving while under the influence of liquor should have their licenses revoked."

The person quizzed indicates the extent of his agreement or disagreement with a statement by placing an "x" before that one of the five positions on the scale—"strongly agree," "agree," "undecided," "disagree," or "strongly disagree"—which most accurately indicates his attitude toward the particular statement.

No claim is made that prediction of so-called "good" and "bad" drivers can be made through use of the yardstick. However, applications which have already been made of the scale show that it can be reliably used, for example, to ascertain the general attitude of adults who have violated speed laws by analyzing their responses to the issues of speeding, law enforcement, and passing. Operators of motor vehicle fleets can also use the Siebrecht yardstick to test the attitudes of future and present drivers toward safe-driving situatons.

# CORRECTIONS AND CHANGES
## In Dec. 1941 Membership Roster

Note: Kindly insert in your copy of the roster

**BAUMEL, EDWARD J., Jun.**
Traffic Engineering Designer, Traffic Engineering Department, Chicago Park District, 425 East 14th Boulevard, Chicago, Illinois

**FAUSTMAN, D. JACKSON, 1st Lieut., Jun.**
On leave, Assistant Planning & Traffic Engineer, City of Sacramento, 264 Public Works Building, Sacramento, California (Send mail to this address)

**GALLETLY, WELLINGTON O., Assoc.**
On leave, Engineer Assistant, Traffic Engineering Division, South Carolina Highway. In Army—send mail home address: 4015 Deveraux Road, Columbia, South Carolina

**GILMAN, ROGER H., Ensign, Jun.**
On leave, Junior Economist, Port of New York Authority. In Navy—send mail home address: 945 Kensington Avenue, Plainfield, New Jersey

**GRAVELLE, GORDON KARL, Lieut., Assoc.**
On leave, Municipal Traffic Engineer, Traffic & Safety Division, Michigan State Highway Department. In Army—send mail: Auburn Gardens Apartment 17-C, Alexandria, Virginia

**HAVENNER, JOSEPH E., Jun.**
Public Safety Department, Auto Club of Southern California, 2601 South Figueroa Street, Los Angeles, California

**HOFER, VICTOR G., Assoc.**
Acting Traffic Engineer, Chicago Park District, 425 East 14th Boulevard, Chicago, Illinois

**HOLMES, ROBERT S., Lieut., Jun.**
On leave, Traffic Engineer, National Conservation Bureau. At present, Instructor, Provost Marshal Generals' School, War Department, Arlington Cantonment, Arlington, Virginia

**HOOVER, KENETH M., Assoc.**
Assistant Transportation Manager, Philadelphia Transportation Company, Broad & Locust Streets, Philadelphia, Pennsylvania

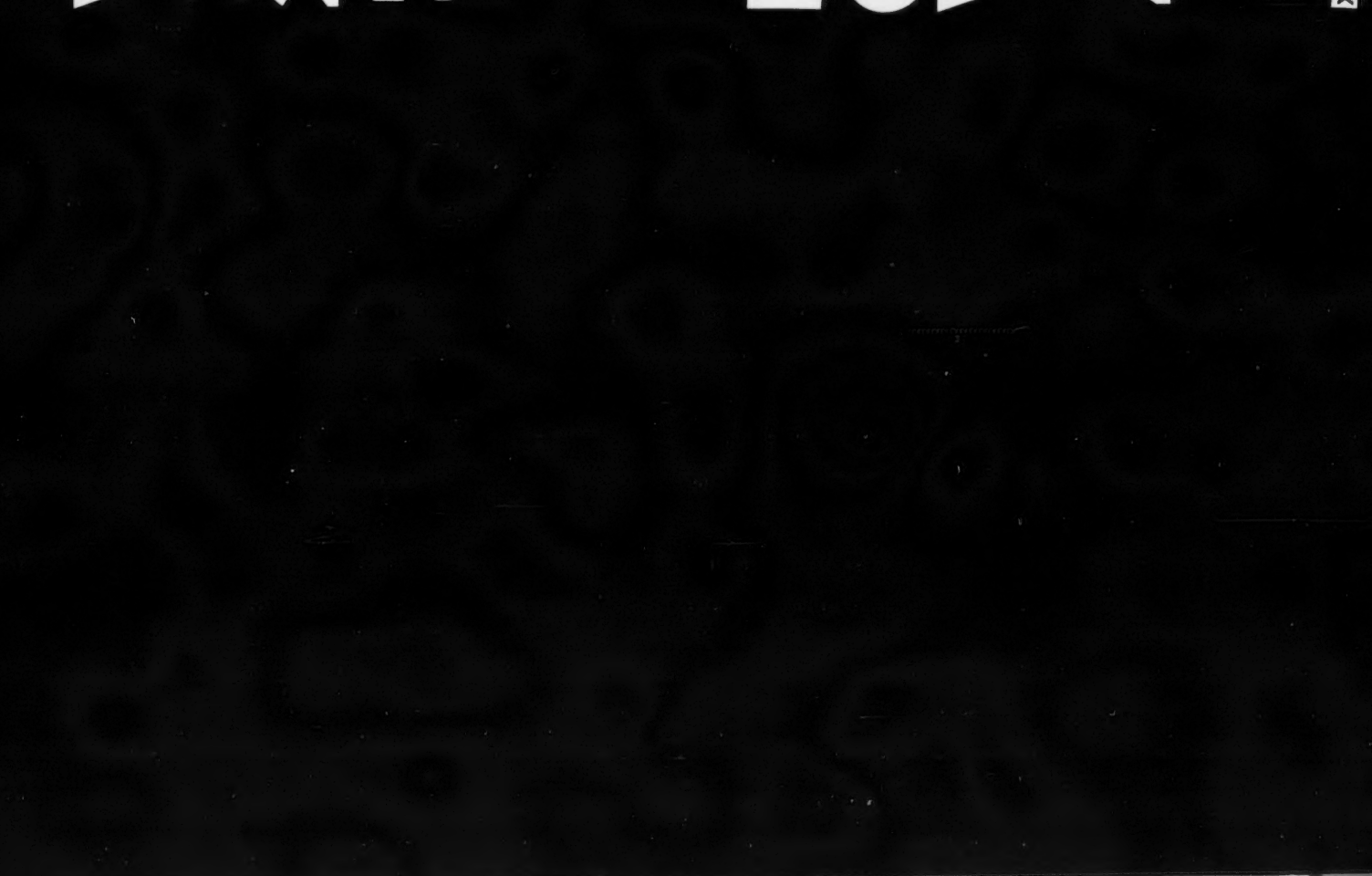
**JELINEK, OTTO K., Mem.**
Traffic Engineer, Chicago Park District, and Chief, Organization on Technique, Office of Civilian Defense, Chicago Metropolitan Area, 425 East 14th Boulevard, Chicago, Ill.

**POWELL, HARRY L., Jr., Mem.**
City Traffic Engineer, 3376 Paty Drive, Honolulu, T. H.

**RADER, LLOYD F., Lieut. Commander, Affil.**
Quarters D, U. S. Naval Station, New Orleans, Louisiana

**STRAETZ, ARTHUR G., Mem.**
5410 Kimball Avenue, Chicago, Illinois

**SWAIN, ROBERT O., 1st Lieut., Assoc.**
On leave, Senior Assistant Traffic Engineer, Texas Highway Department. At present, c/o Engineer Board, Fort Belvoir, Virginia

**TAYLOR, PHILLIP E., 1st Lieut., Assoc.**
On leave, Traffic Engineering Designer, Traffic Engineering Section, Chicago Park District. At Present, Traffic Control Section, Corps of Engineers, Fort Belvoir, Virginia

**UPHAM, CHARLES M., Jr., Jun.**
Manager, Conservation Bureau, The Hartford Chamber of Commerce, 50 Lewis Street, Hartford, Connecticut